

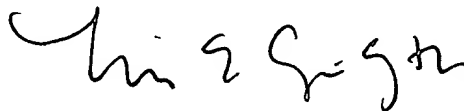
a fifth column line coupled to said fifth column line driver, said fifth column line spanning said plurality of rows, said fifth column line coupled to said second red emitter and said first green emitter of each said second three-color pixel element in each row.

REMARKS

Amendments have been made to the specification for amending numerals in the specification to conform to the figures, and to improve the readability of the application. Amendments made to the claims and specification are of a clerical, typographical or grammatical nature. It is submitted that the proposed amendments to the specification and claims do not constitute new matter.

In view of the foregoing, consideration and an early allowance of this application are earnestly solicited.

Respectfully submitted,
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VERSION WITH MARKED UP CHANGES

In the Specification:

Page 3, line 21 to Page 4, line 7.

Other display methods such as disclosed in U.S. Pat. No. 6,008,868 issued Dec. 28, 1999 to Silverbrook use binary controlled emitters. In using binary controlled emitters, each emitter has a discrete luminance value, therefore, requiring the display to have an[d] exact area to luminance relationship. This prior art used reduced blue “bit depth” built into the panel in accordance with human vision’s lower blue color space increments. Conventional display methods also use a single color in a vertical stripe. Since conventional stripes have limited the Modulation Transfer Function (MTF), high spatial frequency resolution, in the horizontal axis, stripes of a single color are non-optimal.

Page 7, line 19 to page 8 line 2.

One advantage of the three-color pixel element array of the present invention is improved resolution of color displays. This occurs since only the red and green emitters contribute significantly to the perception of high resolution in the luminance channel. Thus reducing the number of blue [pixels]emitters and replacing some with red and green [pixels]emitters improves resolution by more closely matching human vision.

Page 8, line 20 to page 9, line 5.

FIG. 3a is an arrangement 40 of two three-color pixel elements of the present invention aligned horizontally. A blue emitter 42a is disposed at the origin of a first three-color pixel element, and a blue emitter 42b is disposed at the origin of a second three-color pixel element. Red emitters 44a and 44b are disposed in the upper left corners of the first and second pixel elements. Green emitters 46a and 46b are disposed in the lower left corners of the first pixel and second pixel elements. [Red]Green emitters 48a and 48b are disposed in the upper right corners of each pixel element, and [green]red emitters 50a and 50b are disposed in the lower right corners of each pixel element.

Page 10, lines 8 to 15.

The drive matrix disclosed in the present invention uses approximately 16% fewer column drivers to present a given image than does a prior art 2 X 6 drive matrix for the triad arrangement. The column drive lines are reduced since the blue emitters [16]12 are combined. This entire arrangement can be turned 90 degrees such that the combined blue emitters [16]12 are driven by the same row driver. All such topologically identical variants known in the art are possible embodiments of this invention. In addition, the driver type, voltage, and timing can be the same as already known in the art for each device technology.

In the Claims:

1. (AMENDED) A three-color pixel element for a display comprising:
a blue emitter disposed at [the]an origin of a rectangular coordinate system
having four quadrants;

a pair of red emitters spaced apart from said blue emitter and symmetrically
disposed about said origin in a first pair of opposing quadrants of said rectangular
coordinate system; and

a pair of green emitters spaced apart from said blue emitter and
symmetrically disposed about said origin in a second pair of opposing quadrants of said
rectangular coordinate system.

6. (AMENDED) A three-color pixel element for a display comprising:
a pair of red emitters symmetrically disposed about [the]an origin of a
rectangular coordinate system having four quadrants in a first pair of opposing
quadrants;

a pair of green emitters symmetrically disposed about said origin of said
rectangular coordinate system in a second pair of opposing quadrants; and

a blue emitter disposed at said origin of said rectangular coordinate system, said blue emitter having an emitting area larger than that of each of said red emitters and said green emitters.

11. (AMENDED) A three-color pixel element for a display comprising:
a pair of red emitters symmetrically disposed about ~~[the]~~an origin of a rectangular coordinate system having four quadrants in a first pair of opposing quadrants;
a pair of green emitters symmetrically disposed about said origin of said rectangular coordinate system in a second pair of opposing quadrants; and
a blue emitter disposed at said origin of said rectangular coordinate system, said blue emitter having a larger drive-to-luminance gain than that of each of said red emitters and said green emitters.

16. (AMENDED) A three-color pixel element in ~~[the]~~a shape of a square for a display comprising:
a pair of red emitters, outer corners of each forming a first two opposing corners of a square;
a pair of green emitters, outer corners of each forming a second two opposing corners of said square; and
a blue emitter disposed at ~~[the]~~a center of said square.

17. (AMENDED) The three-color pixel element of claim 16 wherein:
said blue emitter disposed at ~~[the]~~said center of said square and is polygonal having sides aligned such that imaginary lines perpendicularly bisecting each side pass through ~~[the]~~ corners of said polygon;

said red emitters are polygonal, each having an inwardly-facing edge parallel to an edge of said polygonal blue emitter; and

said green emitters are polygonal, each having an inwardly-facing edge parallel an edge of said polygonal blue emitter.

18. (AMENDED) The three-color pixel element of claim 17 wherein:

said blue emitter disposed at [the]said center of said square and is four-sided having equal internal angles, having sides aligned such that imaginary lines perpendicularly bisecting each side pass through [the]said corners of said square;

said red emitters are four-sided having equal internal angles, each having a truncated inwardly-facing corner forming a line parallel to an edge of said four-sided blue emitter; and

said green emitters are four-sided having equal internal angles, each having a truncated inwardly-facing corner forming an edge parallel to a side of said four-sided blue emitter.

19. (AMENDED) The three-color pixel element of claim 18 wherein:

said blue emitter disposed at [the]said center of said square and is square-shaped having sides aligned such that imaginary lines perpendicularly bisecting each side pass through [the]said corners of said square;

said red emitters are square-shaped, each having a truncated inwardly-facing corner forming a line parallel to an edge of said square-shaped blue emitter; and

said green emitters are square-shaped, each having a truncated inwardly-facing corner forming an edge parallel to a side of said square-shaped blue emitter.

20. (AMENDED) The three-color pixel element of claim 16 wherein:
said blue emitter disposed at [the]said center of said square and is square-shaped having sides parallel to [the] sides of said square; and
said red emitters and said green emitters are L-shaped and envelop said square-shaped blue emitter.

21. (AMENDED) A three-color pixel element in [the]a shape of a square for a display comprising:
a pair of red emitters, outer corners of each forming a first two opposing corners of a square;
a pair of green emitters, outer corners of each forming a second two opposing corners of said square; and
a blue emitter disposed at [the]a center of said square, wherein said blue emitter having an emitting area larger than that of each of said red emitters and said green emitters.

22. (AMENDED) The three-color pixel element of claim 21 wherein:
said blue emitter disposed at [the]said center of said square and is polygonal having sides aligned such that imaginary lines perpendicularly bisecting each side pass through [the] corners of said polygon;
said red emitters are polygonal, each having an inwardly-facing edge parallel to an edge of said polygonal blue emitter; and
said green emitters are polygonal, each having an inwardly-facing edge parallel an edge of said polygonal blue emitter.

23. (AMENDED) The three-color pixel element of claim 22 wherein:
said blue emitter disposed at [the]said center of said square and is four-sided having equal internal angles, having sides aligned such that imaginary lines perpendicularly bisecting each side pass through [the]said corners of said square;
said red emitters are four-sided having equal internal angles, each having a truncated inwardly-facing corner forming a line parallel to an edge of said four-sided blue emitter; and
said green emitters are four-sided having equal internal angles, each having a truncated inwardly-facing corner forming an edge parallel to a side of said four-sided blue emitter.

24. (AMENDED) The three-color pixel element of claim 23 wherein:
said blue emitter disposed at [the]said center of said square and is square-shaped having sides aligned such that imaginary lines perpendicularly bisecting each side pass through [the]said corners of said square;
said red emitters are square-shaped, each having a truncated inwardly-facing corner forming a line parallel to an edge of said square-shaped blue emitter; and
said green emitters are square-shaped, each having a truncated inwardly-facing corner forming an edge parallel to a side of said square-shaped blue emitter.

25. (AMENDED) The three-color pixel element of claim 21 wherein:
said blue emitter disposed at [the]said center of said square and is square-shaped having sides parallel to [the] sides of said square; and
said red emitters and said green emitters are L-shaped and envelop said square-shaped blue emitter.

26. (AMENDED) A three-color pixel element in [the]a shape of a square for a display comprising:

a pair of red emitters, outer corners of each forming a first two opposing corners of a square;

a pair of green emitters, outer corners of each forming a second two opposing corners of said square; and

a blue emitter disposed at [the]a center of said square, wherein said blue emitter having a larger drive-to-luminance gain than that of each of said red emitters and said green emitters.

27. (AMENDED) The three-color pixel element of claim 26 wherein:

said blue emitter disposed at [the]said center of said square and is polygonal having sides aligned such that imaginary lines perpendicularly bisecting each side pass through [the] corners of said polygon;

said red emitters are polygonal, each having an inwardly-facing edge parallel to an edge of said polygonal blue emitter; and

said green emitters are polygonal, each having an inwardly-facing edge parallel an edge of said polygonal blue emitter.

28. (AMENDED) The three-color pixel element of claim 27 wherein:

said blue emitter disposed at [the]said center of said square and is four-sided having equal internal angles, having sides aligned such that imaginary lines perpendicularly bisecting each side pass through [the]said corners of said square;

said red emitters are four-sided having equal internal angles, each having a truncated inwardly-facing corner forming a line parallel to an edge of said four-sided blue emitter; and

said green emitters are four-sided having equal internal angles, each having a truncated inwardly-facing corner forming an edge parallel to a side of said four-sided blue emitter.

29. (AMENDED) The three-color pixel element of claim 28 wherein:

said blue emitter disposed at [the]said center of said square and is square-shaped having sides aligned such that imaginary lines perpendicularly bisecting each side pass through [the]said corners of said square;

said red emitters are square-shaped, each having a truncated inwardly-facing corner forming a line parallel to an edge of said square-shaped blue emitter; and

said green emitters are square-shaped, each having a truncated inwardly-facing corner forming an edge parallel to a side of said square-shaped blue emitter.

30. (AMENDED) The three-color pixel element of claim 26 wherein:

said blue emitter disposed at [the]said center of said square and is square-shaped having sides parallel to [the] sides of said square; and

said red emitters and said green emitters are L-shaped and envelop said square-shaped blue emitter.

31. (AMENDED) An array for a display comprising:

a plurality of row positions;

a plurality of column positions; and

a plurality of three-color pixel elements, one of said elements disposed in each of said row positions and said column positions, each of said three-color pixel elements comprising:

a blue emitter disposed at [the]an origin of a rectangular coordinate system having four quadrants;

a pair of red emitters spaced apart from said blue emitter and symmetrically disposed about said origin in a first pair of opposing quadrants of said rectangular coordinate system; and

a pair of green emitters spaced apart from said blue emitter and symmetrically disposed about said origin in a second pair of opposing quadrants of said rectangular coordinate system.

32. (AMENDED) The array of claim 31 wherein the spatial frequency of each said three-color pixel element in [the]a row direction is greater than in the column direction.

33. (AMENDED) The array of claim 31 wherein the spatial frequency of each said three-color pixel element in [the]a column direction is greater than in the row direction.

34. (AMENDED) An array for a display comprising:
a plurality of row positions;
a plurality of column positions; and
a plurality of three-color pixel elements, one of said elements disposed in each of said row positions and said column positions, each of said three-color pixel elements comprising:

a pair of red emitters spaced apart from said blue emitters, outer corners of each forming a first two opposing corners of a square;

a pair of green emitters spaced apart from said blue emitters, outer corners of each forming a second two opposing corners of said square; and

a blue emitter disposed at [the]a center of said square.

35. (AMENDED) The array of claim 34 wherein the spatial frequency of each said three-color pixel element in [the]a row direction is greater than in the column direction.

36. (AMENDED) The array of claim 34 wherein the spatial frequency of each said three-color pixel element in [the]a column direction is greater than in the row direction.

37. (AMENDED) In an array of three-color pixel elements, a row structure comprising:

first and second three-color pixel elements, each three-color pixel element including first and second red emitters, first and second green emitters, and a blue emitter;

first and second row line drivers;

a first row line coupled to said first row line driver, said first row line coupled to said blue emitter of said second three-color pixel element, and said first red emitter and said first green emitter of said first and said second three-color pixel element;

a second row line coupled to said second row line driver, said second row line coupled to said blue emitter of said first three-color pixel element, and said second red emitter and said second green emitter of said first and said second three-color pixel element;

first through fifth column line drivers;

a first column line coupled to said first column line driver, said first column line coupled to said first red emitter and said [first]second green emitter of said first three-color pixel element;

a second column line coupled to said second column line driver, said second column line coupled to said blue emitter of said first and said second three-color pixel element;

a third column line coupled to said third column line driver, said third column line coupled to said second red emitter and said [second]first green emitter of said first three-color pixel element;

a fourth column line coupled to said fourth column line driver, said fourth column line coupled to said first red emitter and said [first]second green emitter of said second three-color pixel element; and

a fifth column line coupled to said fifth column line driver, said fifth column line coupled to said second red emitter and said [second]first green emitter of said second three-color pixel element.

38. (AMENDED) An array comprising:

a plurality of rows, each row comprising:

first and second three-color pixel elements, each three-color pixel element including first and second red emitters, first and second green emitters, and a blue emitter;

first and second row line drivers;

a first row line coupled to said first row line driver, said first row line coupled to said blue emitter of said second three-color pixel element, and said first red emitter and said first green emitter of said first and said second three-color pixel element;

a second row line coupled to said second row line driver, said second row line coupled to said blue emitter of said first three-color pixel element, and said second red emitter and said second green emitter of said first and said second three-color pixel element;

first through fifth column line drivers;

a first column line coupled to said first column line driver, said first column line spanning said plurality rows, said first column line coupled to said first red emitter and said [first]second green emitter of each said first three-color pixel element in each row;

a second column line coupled to said second column line driver, said second column line spanning said plurality of rows, said second column line coupled to each said blue emitter of said first and said second three-color pixel element in each row;

a third column line coupled to said third column line driver, said third column line spanning said plurality of rows, said third column line coupled to said second red emitter and said [second]first green emitter of each said first three-color pixel element in each row;

a fourth column line coupled to said fourth column line driver, said fourth column line spanning said plurality of rows, said fourth column line coupled to said first red emitter and said [first]second green emitter of each said second three-color pixel element in each row; and

a fifth column line coupled to said fifth column line driver, said fifth column line spanning said plurality of rows, said fifth column line coupled to said second red emitter and said [second]first green emitter of each said second three-color pixel element in each row.